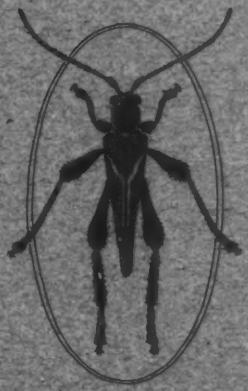
PROCEEDINGS

OF THE

Hawaiian Entomological Society

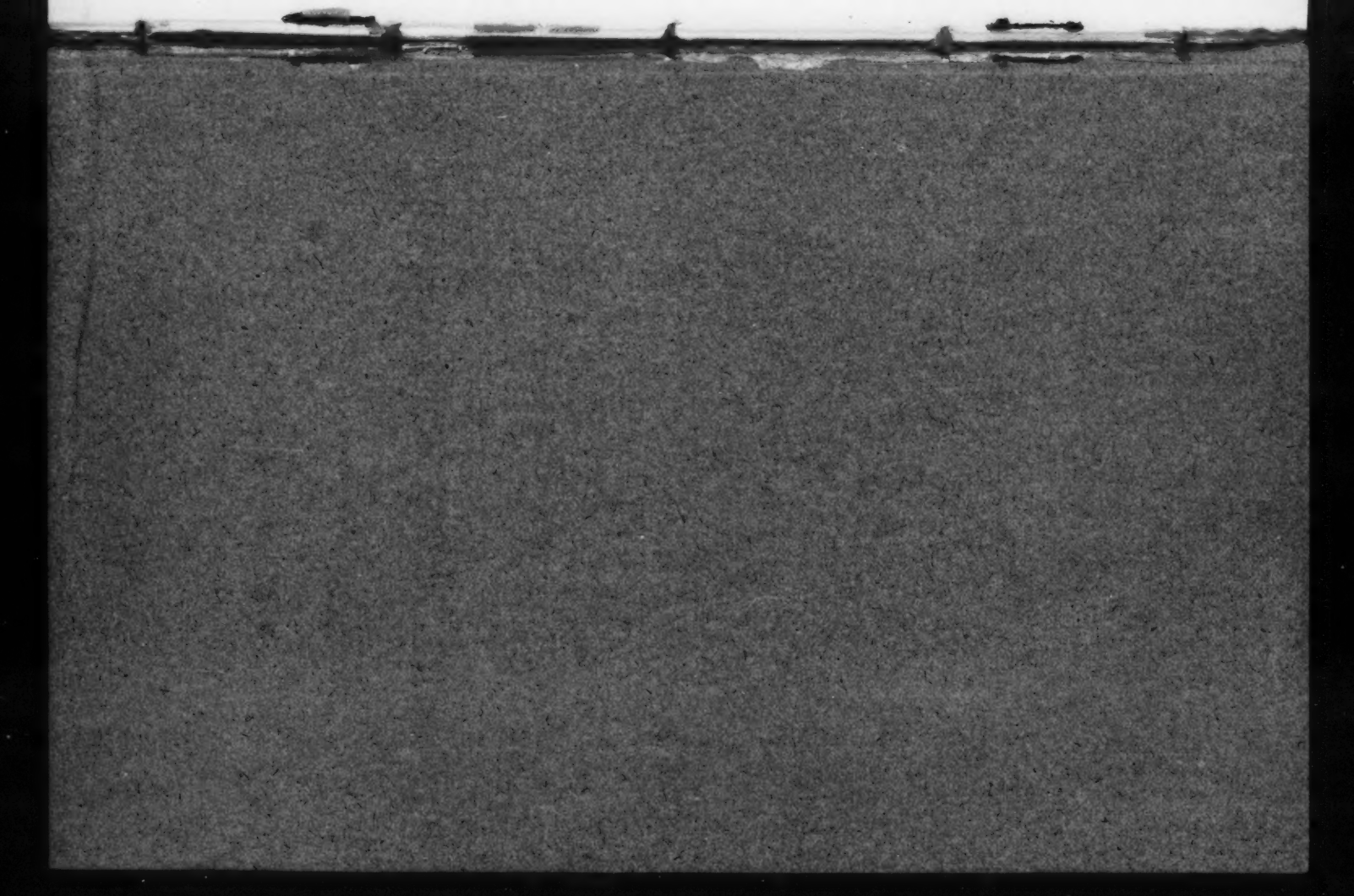
I

(FOR THE YEAR 1905)



HONOLULU, APRIL 3, 1906

PRICE 50c.



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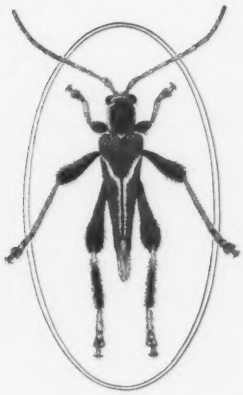

HONOLULU, APRIL 3, 1906

PRICE 50c.

ANNOUNCEMENTS

Meetings are held the first Thursday of each month at 7:30 p. m. in the Board Room of the Bureau of Agriculture & Forestry, corner of South King and Keeaumoku Streets, Honolulu.

* * * *

Members exhibiting specimens at meetings of the Society are requested to hand to the Secretary, *at the meeting*, a note in writing of the generic and specific names of all specimens exhibited together with localities, and any remarks thereon which the exhibitors wish published. In the absence of such notes in writing, the Secretary and Editors will not be responsible for the accuracy of the report of such exhibition or for entire omission of any reference thereto in the Proceedings.

* * * *

The design on the cover represents an undescribed species of the autochthonous genus *Callithmysus*, and has been kindly drawn by Mr. W. E. Chambers, one of the members.

* * * *

The thanks of the Society are due to the Commissioners of Agriculture & Forestry for permitting their Board Room to be used for its meetings.

* * * *

The Society, having no separate Library, does not exchange its publications.

* * * *

All correspondence to be addressed to the Secretary-Treasurer, at the Bureau of Agriculture & Forestry, from whom copies of the Proceedings may be purchased.

Hawaiian Entomological Society

Founded 1905

LIST OF OFFICERS FOR 1905

President	R. C. L. Perkins
Vice President	Alexander Craw
Secretary-Treasurer	Jacob Kotinsky
Members of Executive Committee	Otto H. Swezey D. L. Van Dine

Editors of the Proceedings, G. W. Kirkaldy and Otto H. Swezey

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Membership 1905

† HONORARY * ORIGINAL MEMBER

	*Austin, C. J.		†Newell, Bro. Matthias
	*Bryan, W. A.		*Perkins, R. C. L.
March 9	Cobb, Dr. N. A.	March 9	Peterson, Miss M.
	*Craw, A.		*Swezey, O. H.
	*Eckart, C. F.		*Swezey, Mrs. O. H.
	*Giffard, W. M.		*Terry, F. W.
	*Hosmer, R. S.		*Van Dine, D. L.
	*Kirkaldy, G. W.	May 11	Weinrich, Jr., W.
†	*Koebele, A.	July 10	Weinrich, Jr., Mrs. W.
	*Kotinsky, J.	March 9	Wilder, G. P.

PROCEEDINGS

OF THE

Hawaiian Entomological Society

DECEMBER 15th, 1904.

A meeting, to consider the advisability of forming a Hawaiian Entomological Society, was held in the Board Room of the Bureau of Agriculture and Forestry, at 7:55 p. m.

After the meeting was called to order by Mr. Kotinsky, Mr. Kirkaldy and Mr. Kotinsky were elected temporary chairman and secretary, respectively; others present were Messrs. Austin, Craw, Hosmer, Terry and Mr. and Mrs. Swezey.

The organization of the proposed Society was discussed fully by all present, and a Constitution Committee was appointed, consisting of Messrs. Craw, Kotinsky and Terry, to report at the next meeting.

JANUARY 26th, 1905.

The first regular meeting was held in the Board Room of the Bureau of Agriculture and Forestry.

The following Constitution was adopted, Mr. Perkins being temporarily in the chair.

CONSTITUTION.

ARTICLE I.—NAME.

The name of this organization shall be THE HAWAIIAN ENTOMOLOGICAL SOCIETY.

ARTICLE II.—OBJECTS.

The objects of the Society shall be to promote the study of entomology in all possible bearings, and to encourage friendly relations between those in any way interested in the science.

ARTICLE III.—MEMBERS.

The Society shall consist of active, corresponding, and honorary members. No corresponding members shall be elected from residents on the Island of Oahu. The names of candidates for membership shall be brought before the Society at a regular meeting by either an active member or the secretary, to whom application may be made. These candidates shall be balloted for at the next regular meeting of the Society. A majority vote of the active members present when the ballot is taken shall be necessary for election.

ARTICLE IV.—OFFICERS.

The officers of the Society shall be a President, Vice-President, and Secretary-Treasurer, to be elected by ballot at the annual meeting, except the Vice-President, who shall be appointed by the President at the same meeting. There shall be an Executive Committee, consisting of the officers of the Society and two members to be elected by the Society.

ARTICLE V.—DUTIES OF OFFICERS.

SECTION 1. The President, or, in his absence, the Vice-President, shall preside at the meetings of the Society and of the Executive Committee. It shall be the duty of the President to deliver an address at the closing meeting of the year.

SECTION 2. The duties of the Vice-President shall be to perform all duties of the President in the absence of the latter.

SECTION 3. The Secretary-Treasurer shall take and preserve correct minutes of the proceedings of the Society, preserve all publications and other property belonging to the Society, conduct all official correspondence of the Society, keep a list of all members together with their addresses, solicit papers and notes for the meetings, give due notice, in writing, of all meetings at least three days in advance; shall have charge of all the moneys of the Society, and shall make disbursements only under direction of the Executive Committee; he shall collect all fees and assessments, and notify all members who are in arrears, and submit a report of the finances of the Society at the annual meeting or whenever called for.

SECTION 4. The affairs of the Society shall be conducted

by the Executive Committee, whose duty it shall be to have direction of the finances, audit the accounts of the Secretary-Treasurer, provide for publication, and transact any other necessary business.

ARTICLE VI.—MEETINGS.

Five (5) members shall constitute a quorum. The regular meetings are to open 7:30 p. m., and shall be held, unless otherwise ordered, on the first Thursday of each month. The annual meeting for the election of officers shall be the regular meeting for the month of January. The nominations for officers shall be accepted at the preceding meeting. Special meetings may be called by the Executive Committee.

ARTICLE VII.—FEES.

The annual fee for active members shall be five dollars ($5.00), payable upon election and at each annual meeting thereafter, unless such election take place after the last day of September, when no fees are to be collected for that year. No fees are to be collected from corresponding members, or ladies who are active members. Any member in arrears for one year may, after due notification, be dropped from the rolls. No member in arrears shall be entitled to vote.

ARTICLE VIII.—AMENDMENTS.

The Constitution of the Society may be amended at any regular meeting by a two-thirds vote of the active members present, specific notice of such amendment having been given in writing to all active members at least one month previously.

ARTICLE IX.—ORDER OF BUSINESS.

The order of business of the regular meetings, unless otherwise ordered by the Executive Committee, shall be as follows:

1.—Reading and Approval of Minutes of Last Meeting.
2.—Reports of Officers and Committees.
3.—Election of Members.
4.—Miscellaneous Business.
5.—Reading of Papers and Discussions.
6.—Notes and Exhibitions of Specimens.
7.—Motion to Adjourn.

The following officers of the HAWAIIAN ENTOMOLOGICAL SOCIETY were elected for 1905:

President, R. C. L. PERKINS.

Secretary-Treasurer, JACOB KOTINSKY.

Members of Executive Committee, OTTO H. SWEZEY and D. L. VAN DINE.

The President appointed MR. ALEXANDER CRAW as *Vice-President.*

Upon motion of Mr. Van Dine, seconded by Mr. Craw, Mr. Albert Koebele was unanimously elected an Honorary Member of the Society.

FEBRUARY 9th, 1905.

The second regular meeting of the Society was held in the Board Room of the Bureau of Agriculture and Forestry, Mr. Perkins in the chair.

Honorary Member—Brother Matthias Newell of Hilo was unanimously elected an Honorary Member.

PAPERS.

Mr. KOTINSKY read a part of his *"History of Economic Entomology in Hawaii,"* the whole of which will be published elsewhere. In the course of the subsequent discussion, Mr. Perkins stated that *Sphenophorus obscurus* was known upon these islands about 1865, and was injurious at about that period. This did not necessarily imply that it was brought here then, because since it occurs in papaias, cocoanuts and royal palms, besides sugar cane, it might have been introduced with some of the plants brought here many years previously. He also stated that *Coccinella abdominalis* was affected by the Braconid parasite *Centistes americana* Riley, which is so destructive to *Coccinella repanda,* before the latter was brought by Koebele to the Islands.

Mr. R. C. L. PERKINS submitted "*Entomological and Other Notes on a Trip to Australia,*" and subsequently presented the following summary for publication:

"Sydney was reached by Koebele and myself in May, and found cold. An orange orchard in Parramatta was scoured for ladybirds, and the first consignment was sent from those collected there. There was no sugar cane, but there were many leaf-hoppers

upon the grass and these were observed by Mr. Koebele to be parasitized by Hymenoptera. No one in Australia seems to have ever studied the parasites of Fulgoridae to any extent. After leaving Sydney, the next ten days were spent at Brisbane and in the Botanical Gardens the first cane was observed and a few hoppers noticed upon it. Here, also, were found the dipterous parasites of leaf-hoppers; some of these parasites, the maggot of which lives within the body of the hopper, might have proved useful here, but the work of collecting and introducing them successfully would have taken months of exclusive labor and then might have failed. It was cold and even frosty there.

"Bundaberg was the next stop; it was very warm at midday and very cold at night, the latter so much so that the cane was turned yellow. Leaf-hoppers were found in the cane fields and Mr. Koebele verified his prediction by breeding some two or three species of hopper-egg parasites from eggs collected there. In our anxiety to get north we stopped but ten days.

"One day was spent at Townsville; this place was found very dry and bare; no green grass, no cane. The most noticeable thing was a row of fig-trees, the leaves black with fungus, on which Siphantas had previously swarmed. These, however, had been badly parasitized and numerous cocoons of the parasite plastered the leaves.

"At Cairns, systematic work on cane- and other leaf-hoppers was begun; the cane was found to be inhabited by half a dozen of these, all about equally numerous, and none injurious. Most conspicuous in the cane was a blue lady-bird collected by Koebele years ago, and determined by Blackburn as *Orcus ovalis*. It feeds on the rust of cane and grasses, whereas the very similar *O. chalybeus* is distinctly a tree species, and has the usual carnivorous habits. Specimens of a very fine blue lady-bird were found feeding on Diaspines on *Pandanus;* seemingly a valuable species to introduce, thev died out in course of transit. Buth the Coccinellid and Scale are comparatively rare. A black lady-bird of about the same size and shape was also observed, while a small patch of forest close to a cane field was examined and some good lady-birds were found there. An ant (*Pheidole*), which is our common species in Hawaii, swarmed everywhere, and no lady-bird or its larva could get at the scales on many badly affected trees.

"On the whole, entomologically, Cairns was disappointing in July and August, the two months we spent there. Local entomologists considered collecting hardly worth while at this season. Birds were interesting and varied and in fine plumage and it was a great pleasure to see such a number of forms new to me. Economically the crow is very important in some cane districts. It is very tame, following the plough and eating the grubs of the injurious chafers as they are turned up. Having gorged to repletion, it will take a rest and then recommence feeding. These chafer grubs are, as is well known, destroyed by the larva of a parasitic Fossorial wasp, *Dielis*. In some places a small *Rhipidura* was seen catching insects in the cane-fields; it is extremely like our Hawaiian fly-catcher (*Chasiempis*) but ours will never leave the forest for the cane-lands. Another Australian species is commonly seen catching flies off the backs of cattle. It would be most valuable in these islands. The tropical birds are wantonly slaughtered around Cairns, by boys and men, who are always to be seen on a Sunday, killing anything that comes their way.

"Most of the time at Cairns was spent in studying leaf-hoppers on graminaceous plants. The cane-hopper was found breeding on cane only, never on grasses. Tryon, the State entomologist, who knows the Queensland insects of economic importance better than any one, says the corn-hopper (*Peregrinus maidis*) is a native of Queensland, being found on native grasses. This is very doubtful, as in other countries it will attack native grasses and foreign alike. The fact that it does much damage and that we found no specific natural enemy points otherwise. One man at Cairns told me he lost five crops of corn in succession from this hopper.

"At the end of August we returned to Townsville. There had been no rain and the place was disgusting. Rockhampton was hot, the temperature over 100° F., but the gardens were very pretty with such masses of flowers, as we had not seen elsewhere.

"When we left Cairns, forest fires were general throughout Queensland and the destruction of animal life must have been enormous, in addition to the waste of fine timber. We worked in two very different kinds of forest in Australia—the one chiefly characterized by its many Eucalypti, and the other of a regular

tropical character. Both seem to be particularly hardy, and are ruthlessly and relentlessly destroyed by the people. They ring-bark and burn everything to provide a miserably poor pasture land. In some places acres and acres of valuable trees have been destroyed and the land allowed to become covered with injurious weeds, so that it is absolutely valueless from any point of view, yielding neither timber nor forage. Many of the Australian woods are very fine for building and other purposes; they are much more hardy and quick-growing than our Hawaiian trees, and many could be no doubt imported here with great advantage.

"The following is a very rough list of the leaf-hopper parasites that we observed. They have not yet been critically examined.

Chalcid and Proctotrupid parasites bred from leaf-hopper eggs		6 sp.
Dryinidae	parasitic on nymphs or mature hoppers	30 sp.
Chalcids	ditto	2 sp.
Diptera	"	20 sp.
Stylopidae	"	3 sp.
Lepidoptera	"	3 sp.

"Probably all these are new to science as species and many also as genera."

In reply to Mr. Craw, Mr. Perkins said that all cane insects from Queensland should be kept out. They have moth-borers, including a *Nonagria,* which is parasitized, however, by an *Encospilus.* There are at least twelve species of leaf-hoppers on their cane. The cane-hopper of Fiji is not the same as the one in Australia; it has a Stylopid parasite, which might be useful here. The Australian forests did not seem to suffer much from insect injury, when in their natural condition.

There are many fruit-flies of the genus *Dacus* in Australia. On the coast steamers the larvae and pupae were seen dropping from crates of bananas and tomatoes in dozens on the deck. They do much damage in Queensland, and the oranges are also badly infested.

Exhibitions.

Mr. Kotinsky exhibited specimens of the Elaterid, *Chalcolepidius erythroloma,* 44 specimens of which were collected in the course of a couple of months by Mr. Giffard on one Koa tree

in a row of about eight or nine lining the road to Tantalus. Mr. Perkins suggested that such a collection upon one tree is a common phenomenon in insect life when there is some attraction either in the form of food or odor.

Mr. Terry exhibited a living male and female of *Callineda testudinaria* which came here from Australia on December 13th. The female began to lay eggs on the 15th, and has since deposited 32 batches, comprising 897 eggs. She apparently is still capable of laying a good many more.

MARCH 9th, 1905.

The third regular meeting was held at the usual place, Mr. Craw, Vice-President, in the chair.

Members elected—Miss Melika Peterson, Dr. N. A. Cobb and Mr. Gerrit P. Wilder.

PAPERS.

Mr. KOTINSKY read the whole of his paper on *"The History of Economic Entomology in Hawaii."* In the discussion that followed, Mr. Kirkaldy's objection to the statement that native vegetation has been driven to any large extent into the mountains by the introduced flora was met by Mr. Austin with the assertion that to his knowledge the native trees came down to water level in wet places. "Kou" (*Cordia subcordata* Lam.), for example, is occasionally found on low levels. Mr. Austin also believed that guava was introduced into the islands about 1830. Mr. Kirkaldy said that *Lycaena blackburni,* a questionably native butterfly, is occasionally found as low as Punchbowl, and Mr. Terry stated that *Vanessa tameamea* is also at times found in town.

EXHIBITIONS AND NOTES.

Mr. Terry stated that the *Callineda testudinaria,* mentioned at the last meeting, had raised her egg-record to 944; altogether there were 35 batches, the first being laid on December 13th, the last on February 14th.

Mr. Terry also exhibited a representative collection of Hawaiian butterflies, ten species in all. *Pyrameis tameamea* is the native species and one other, *Lycaena blackburni,* doubtfully so; all the rest being introduced. This was supplemented by Mr. Kotinsky's

exhibition of an inflated larva and two live pupae of the native species.

Mr. Kirkaldy exhibited three old entomological works which he had recently purchased: there were Thomas Moufet's "Theatrum Insectorum," London, 1634; Swammerdam's "Historia Insectorum Generalis," 1693; and Frisch's "Beschreybung von allerley Insecten in Teutschland," 1720-38. Considering their age, every one present marvelled at the excellent state of preservation of the prints and cuts. Dr. Cobb stated upon the authority of an expert on paper that our modern half-tones, which are printed on paper so heavily chalked, will not last over fifty years.

Mr. Kotinsky exhibited dipterous larvae in a tube; into this tube were originally deposited whatever larvae or pupae seemed dead or dying selected from a lot sent by Mr. Koebele from Australia. The object of the selection was to breed up some parasite of these Diptera, but he was surprised to find some two or three days later that the tube swarmed with live dipterous larvae, although he had constantly kept the tube closed with a cotton plug. Mr. Terry suggested that some Sarcophagid might have surreptitiously inserted her ovipositor and dropped some eggs or larvae into the tube. Dr. Cobb stated that he had observed several dozen flies aboard ship all the way from San Francisco to Honolulu. Mr. Bryan stated that during a cruise on a sailing vessel lasting some two months, he had observed flies constantly upon it.

The question raised by Mr. Kotinsky regarding the seasons of these islands, as judged by the manifestations of life, elicited an extensive discussion, participated in by Messrs. Bryan, Terry, Kirkaldy, and Kotinsky. Mr. Bryan stated that, as a general rule, birds upon these islands nest most commonly about the end of February to the beginning of April, which leads him to believe that our month of March corresponds in a way to May or June in the temperate zones. It so happens that it rains very freely during the nesting season, and many nests with eggs of young are often drowned out. His belief is that it is not so much the rainy weather or the food supply that affects the season of nesting as such climatic conditions as temperature, etc. He had one nest of young of an owl (*Asio accipitrinus subsp. sandwicensis*), that is a sub-species very closely allied to the American type-form, which was secured in November. Another nest of owls was

brought to him in March; he has nests of the Hawaiian hawk which were secured in autumn. These facts lead Mr. Bryan to the belief that possibly, owing to the insecurity of nesting in March, they are adapting themselves by transferring the nesting season to autumn. However, the data are too meager as yet to allow of anything but speculative generalizations. Mr. Kotinsky based his belief on the present month corresponding to spring in the temperate zone on the following: The Koa tree (*Acacia koa*) is now everywhere in blossom. Out of six specimens of *Plagithmysus pulverulentus* (?) collected by Mr. Terry and himself, on Koa on Kalihi Heights on February 26th, three were in the act of oviposition. *Pyrameis tameamea,* a beautiful but infrequent sight during the winter months, was observed by Mr. Giffard and himself on Tantalus on March 5th in droves of 20 and more fluttering about certain spots on Koa trees. In general, there seems a revival of insect and vegetable life. Mr. Terry suggested that the nesting season of birds is gauged by the food supply. Mr. Craw stated that the San Jose scale (*Aspidiotus perniciosus*) as observed in California by Prof. Comstock and himself in 1880, had only produced one brood, but shortly after that all stages of the insect could be found upon the trees throughout the summer. Mr. Kotinsky said that in the opinion of many entomologists the San Jose scale having spread out to its farthest limits, north, south, east, and west of North America, seems now to have run its course, so to speak, and ceased to be the dread it once was. Neither could this degeneracy be attributed, in the Eastern states at least, to the activity of parasites. Mr. Bryan, concurring, referred to the instance of the Western grasshopper which has ceased to be a dread pest. Mr. Craw asserted his unshaken belief in parasites, and related the story of *Lecanium oleae* being subdued by *Scutellista cyanea;* he also stated that Mr. Boggy had recorded a grasshopper parasite which killed 90% of its host. Dr. Cobb remarked that the grasshopper fungus has been experimented with in New South Wales, but met with no greater success than elsewhere. The hopper-dozer is used effectively there.

Mr. Kirkaldy raised the question of grasshoppers as food; he had tried some but found them rather gritty. He had also some years ago sampled some dried *Arctocorisa mercenaria*, used for food in Mexico, but could not speak favorably of the flavor, this

being probably due to excessive dessication. Mr. Terry said he tasted "Kungu" cake made of a species of *Corethra*, which is collected in myriads in the lake district of Central Africa; the flavor and texture suggested oatmeal. Dr. Cobb stated that at one time a committee was appointed in Nebraska to experiment with grass-hoppers for food. The food was found palatable but its general introduction seems to have failed.

APRIL 6th, 1905.

The fourth regular meeting was held in the usual place, Mr. Perkins in the chair.

PAPERS.

Mr. G. W. KIRKALDY spoke on *"Stridulation in the Corixidae"* and subsequently presented the following brief note for publication:

"As early as 1727 Frisch announced that the common European Broad Water-Bug (*Ilyocoris cimicoides*, Linne) produced a fiddling sound with its neck; this has not been properly elucidated, however, up to the present. Last year Bueno of New York discovered the stridulatory areas in *Ranatra*. The first observations on Corixidae were recorded by Robert Ball of England in 1846 and the latest by Kirkaldy in 1901. (Journ. Quekett Micr. Club, Apr. 1901). The anterior tarsus is unjointed; it is flattened and dilated, in shape more or less like a knife blade. On the inner face of this tarsus there are in the males numerous chitinous pegs, which vary in number, form and position in the various species (constituting the most valuable and precise test of a species in this family). On the anterior femora there are rows, on the inner face, of small spines or pegs and it is by the friction of the tarsal pegs on the pegs of the opposite femur that the sound is produced. It was formerly supposed that the striated mouthparts were thus operated upon, but in 1901 Kirkaldy demonstrated the employment of the femoral areas. It is only in the males that these pegs occur. A further (supposed) stridulatory organ was announced in 1873 by F. B. White. This is a remarkable structure consisting of several (varying in form and number) more or less overlapping chitinous plates on a pedicel attached to one of the abdominal tergites. Kirkaldy thought that if this were really a stridu-

latory organ; it must operate during the nocturnal flights that these bugs frequently take, as it seemed impossible that it could operate under water. This organ also occurs only in the males, and not in all the species."

The remarks were illustrated by two microscope slides and by figures of the only Hawaiian Corixid, *Arctocorisa blackburni* (F. B. White) which has so far only been found in these Islands, although it belongs to a Central American and Antillean group characterized by the shape of the anterior tibiae in the males.

Mr. O. H. SWEZEY then read his *"Observations on Insects During a Recent Trip on Hawaii,"* illustrated by numerous specimens:

HYMENOPTERA

Sceliphron caementarium: No adults were seen, but the nests of this mud-dauber wasp were common, and they always contained larvae or pupae, which shows that this species is continuing the habit of hibernation which it had in the States, where it hibernates as larvae in the cells of its mud-nest.

Odynerus nigripennis: Very abundant. They gather the larvae of *Hymenia recurvalis* and other green caterpillars to store up for food for their young. Many other species of *Odynerus* are abundant.

Polistes aurifer and another species are everywhere in cane fields, feeding upon the "honey dew" deposited upon the cane leaves by the leaf-hoppers.

Xylocopa brasilianorum: This large carpenter bee is abundant and does considerable damage to fence and telephone posts and some buildings, especially such as are made of redwood lumber.

Ants: Swarms of them in cane fields, and they must consume a great many of the young leaf-hoppers.

Ecthrodelphax fairchildii: This leaf-hopper parasite was seen only in the plantations of Kau, one plantation of Kohala, and at Puako. Numerous attempts have been made to introduce it in the plantations of the Hilo and Hamakua Districts, but it apparently has failed to become established.

Chalcis obscurata,
Pimpla hawaiiensis,
Echthromorpha maculipennis, and

a Braconid: These four are parasites upon the larvae of *Omiodes accepta,* the cane leaf-roller. The Braconid is most abundant. *Echthromorpha* occurs only in the higher cane fields.

Centistes americana: Parasitic on *Coccinella repanda.* A few seen.

DIPTERA

Pipunculus sp:* This internal parasite of the leaf-hopper was found in all of the plantations of the island except Puako and most of those of Kohala.

Xanthogramma grandicornis: Common. Its larvae feed upon cane aphis and other species of aphis.

Volucella obesa: This large blue Syrphid very abundant everywhere.

Eristalis tenax: Only a few seen.

Eristalis punctulatus: Very abundant.

A Tachinid: Parasitic on *Omiodes accepta;* a few seen.

Lantana Fly (Agromyzidae): Has been introduced in Hamakua, and its work is showing.

LEPIDOPTERA

Omiodes blackburni: The palm leaf-roller is doing a good deal of damage to palms on the windward side of the island.

Omiodes accepta: The cane leaf-roller is found more or less everywhere, but is not injurious except in some of the highest fields, about 1200-1800 feet elevation. Parasites are doing good work in keeping it from getting worse.

Hymenia recurvalis: This moth is very abundant in cane fields, its larvae feed upon an Amaranth-like weed (*Euxolua*).

Lantana Moth: This apparently was introduced in Hamakua along with the lantana fly, and is helping it in preventing the production of lantana seed.

Cutworms: Are reported to be very destructive to garden crops.

Pieris rapae: Abundant in cabbage patches.

Vanessa tameamea: This beautiful native butterfly is abundant, especially above the 1,000 foot elevation.

Anosia plexippus: Very abundant in lower regions.

Lycaena blackburni: Scarce.

Lycaena baetica: Very abundant, its larvae feeding upon beans, crotalaria and other legumes.

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* Since described as P. *juvator* Perkins.

COLEOPTERA

Coccinella repanda: Common everywhere, especially in cane fields, feeding upon aphis and young leaf-hoppers.

Cryptolaemus montrouzieri: Common, feeding upon cane mealy bugs, and the mealy bugs of guava and alligator pear.

Rhizobius ventralis: Abundant, feeding upon mealy bugs on guava and alligator pear.

Platyomus lividigaster: Common, feeding upon aphis of various species.

Scymnus vividus: Common, feeding upon cane aphis.

Vedalia cardinalis: Two specimens seen at Ookala feeding upon cottony cushion scale.

Sphenophorus obscurus: Found on all sugar plantations, but not doing any special damage except in a few.

HEMIPTERA

Icerya purchasi: A few seen in Hamakua District.

Orthezia insignis: Was not seen on the island.

Trechocorys calceolariae: (Sugar-Cane Mealy-Bug.) A few on most plantations, but doing no special damage. Mealy bugs are very abundant on guava, palm, and alligator pear.

Aphis sacchari: Cane Aphis. A few found on most plantations but usually of not much significance.

Siphanta acuta: Very abundant, feeding upon coffee, mango, sumac, and other shrubs.

Perkinsiella saccharicida: Plenty of the leaf-hoppers on most plantations, but in most cases the managers consider them on the decline. This is probably due to the increase in abundance of their insect enemies.

Oechalia griseus: Common in the higher cane fields of Kau, feeding upon leaf-hoppers and leaf-rollers.

Zelus peregrinus: Common on the windward side of the island.

Reduviolus blackburni: Common in the cane fields everywhere.

ORTHOPTERA

Anisolabis annulipes and

Chelisoches morio: These two earwigs feed upon leaf-hoppers, the former at the north end of the island and the latter more generally distributed.

Cockroaches: Several species abundant in situations they are respectively accustomed to.

Praying Mantis: Several egg-capsules were seen in the Hamakua District.

Gryllotalpa africanus: Not seen on the island.

Elimaea appendiculata: A few found in all Districts.

Xiphidium varipenne: Very abundant in nearly all of the plantations, but none at Puako. They live largely upon leaf-hoppers.

NEUROPTERA

Anax junius: Conspicuous everywhere.

A Hemerobiid: Common in cane fields.

Chrysopa microphya: This lace-wing fly abundant in many cane fields, also on trees and shrubs, feeding upon leaf-hoppers, mealy bugs, scale insects; and probably the nymphs of *Siphanta acuta.* Several larger species of lace-wing fly were found feeding on leaf-hoppers in fields at the higher elevations—1,600-2,500 feet.

MAY 11th, 1905.

The fifth regular meeting was held, Mr. Perkins in the chair. Dr. Walter Evans of Washington was present as a visitor.

Election of Member—Mr. Wm. Weinrich Jr., of Sisal.

Mr. D. L. VAN DINE read the following "*Notes on a Comparative Anatomical Study of the Mouth-Parts of Adult Saw-Flies.*"

In beginning the study of the mouth-parts of any group of insects, one naturally commences with the lowest or most generalized members, expecting of course to find the mouth-parts of these older forms to present the most generalized condition to be found in the order. Hence, in beginning a study of the comparative anatomy of the adult Hymenopterous mouth several years ago in the entomological laboratory of Stanford University, under the direction of Prof. Vernon L. Kellogg, the writer began on those of *Tenthredinidae.* A few generalizations on the drawings made in connection with the study may prove interesting to the members of this Society.

Following Cresson's list all the sub-families were studied with the exception of *Hylotominae.* The parts present difficulty in dissection for the reason that they are intimately joined or connected by a very efficient membrane or tissue. The exception is the mandibles which act independently. To further insure the mutual

action of the parts, this connecting membrane is supplied with certain highly chitinized portions which act presumably as "braces" or "connecting rods." The parts, as a whole, are very strong, being highly chitinized throughout. So much so, in fact, that it was found necessary to first boil them in caustic potash (5 per cent. solution) before attempting to study them.

The position of the mouth-parts on the head is ventral. The clypeus extends out over the parts with the exception of the mandibles, which fold together directly in front, and the distal ends of the maxilary palpi and the labrum-epipharynx.

That the parts do represent a generalized type may be seen by looking at those of *Lyda* sp. (Plate I, figure 1.) The parts are drawn *in situ* to give an idea of the comparative size of the different parts and their position in relation to each other. We have here mandibles (*md*), strong, highly chitinous, large in comparison to the other parts and acting independently. The view is ventral and the labium (*li*) is seen overlying the other parts. The mentum (*m*) is shield shape, the lateral edges being bent inward like the sides of a saddle. From the mentum extend distad the glossa (*gl*) and the paraglossa (*pgl*). Caudad of the mentum and lying in the connecting tissue is a portion that is chitinized and supplied with hairs. Until further studies of higher orders are made this part will be called the sub-mentum (*sm*), since in going from the lower to the higher forms this structure becomes more and more important and is in the family *Apidae* distinctly joined to the mentum. The tendency, however, is shown within the family *Tenthredinidae*. From the base of the paraglossa extend laterad on either side the labial palpi (*lip*). They are four lobed. There is an hypopharynx but it is not distinct in some species. It is well shown in drawings farther on.

Right and left of the labium lie the maxillae (*mx*). One of another species can be seen dissected out in Plate II, figure 4. This figure will serve equally well in describing the parts. This is figured for the reason that in *Lyda* sp. the cardo (*cd*) is not visible since it forms with the stipes (*st*) a right angle. The maxillae are not unlike the general type, that is, the cardo, stipes, galea, and lacinia are easily understandable. The stipes, as is also the mentum of the labium, is very much arched, making it difficult to show the true form by drawing one aspect.

Returning to *Lyda*, there can be seen lying directly beneath the parts and in the center, the distal end of the labrum-epipharynx (*lr-ep*). This is shown dissected out in Plate I, figure 2. The so-called "braces" of the labrum are in the form of two distinct bars.

Plate II, with the exception of figure 6, represents the parts of *Lygaeonematus erichsonii* dissected out. These parts are not drawn to scale for the great difference in size does not make this feasible. Figures 1 and 2 show, respectively, the left and right mandibles. They are articulated to the head by a condyle, shown in the figures. The mandibles are further connected to the head by mandibular ligaments, not well shown in the drawings of this saw-fly, but well seen in a species of the family Formicidae, genus *Aphaenogaster*, here presented for that purpose (Plate II, figure 6.) The mandibles, as in *Lyda*, are separate from the other parts. They are folded together when at rest, the difference in the structure of their inner margins making this possible.

The labium (Plate II, figure 3) is drawn from a dorsal or inner aspect. Here is seen a hypopharynx (*hyp*). In the membrane below occurs what has been called the sub-mentum (*sm*). Beneath the hypopharynx and lying beneath its curving edges, is the mentum (*m*). From it arise, as in *Lyda*, the glossa, the paraglossa, and the four-lobed labial palpi. The maxilla, shown in figure 4, has already been described. Attention should be called, however, to the connecting membrane which unites it to the labium.

Plate II, figure 5, shows the labrum-epipharynx. It possesses that peculiar chitinized portion extending in the membrane to the other parts. This structure is common to all saw-flies studied. It is called the "brace of the labrum," and has already been referred to. It varies from a structure consisting of two distinct bars to one where the two have become fused into one solid part. In *Lyda* (Plate I, figure 2) this "brace" is seen as two bars connected near the labrum. In *Lygaeonematus erichsonii* (Plate II, figure 5) there is noticeable a tendency towards separation and also in *Dolerus arvensis* (Plate I, figure 6). In *Tenthredo rufopectus* (Plate I, figure 5) the "brace" occurs as

one structure. Its function may be to strengthen the connection between the parts and insure their mutual action.

The aspect of figure 5 in Plate I is ventral to show the inner surface. This is the epipharynx on which occur the sense-pits of taste. These structures agree with the descriptions of the "pits" or "cups" and "hairs" of taste as given by Packard.

That part labeled sub-mentum (*sm*) in Plate I, figure 1, is shown greatly enlarged in figure 3. In a higher genus represented by *Macroxyela ferruginea* (Plate I, figure 4) we have the same structure more closely related to the mentum.

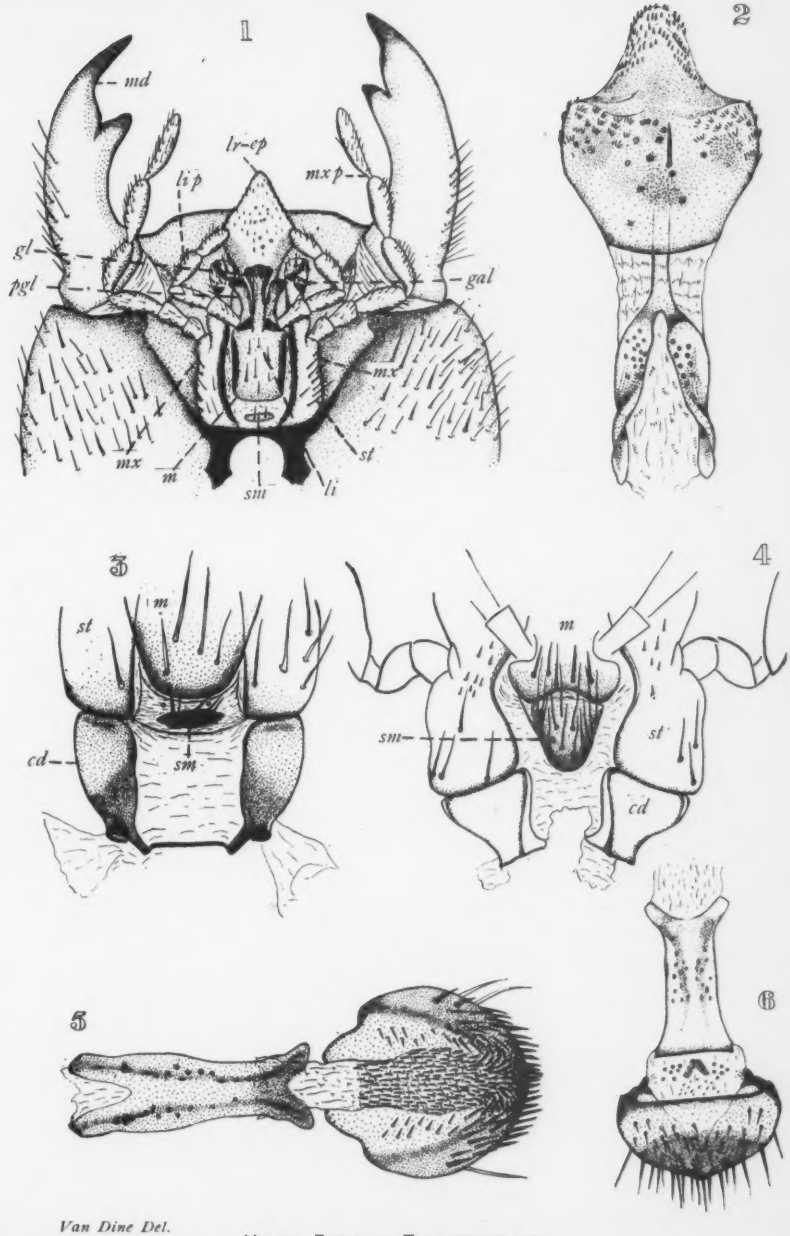
In Plate I, figure 3, is seen a chitinized portion of the membrane connecting the proximate ends of the cardo (*cd*). This structure was not followed out but it may be that it can be homologized to the lora in the honey-bee mouth-parts. The mouth-parts as a whole are plainly orthopterous in type and the various parts by their position and structure can be homologized but only in so far as the position and structure are concerned.

Exhibitions and Notes.

Mr. Perkins exhibited the male and female of a moth, a species of *Epipyrops,* together with their host, an Australian hopper. A study of the venation shows this species to be allied to Tineidae and Psychidae.

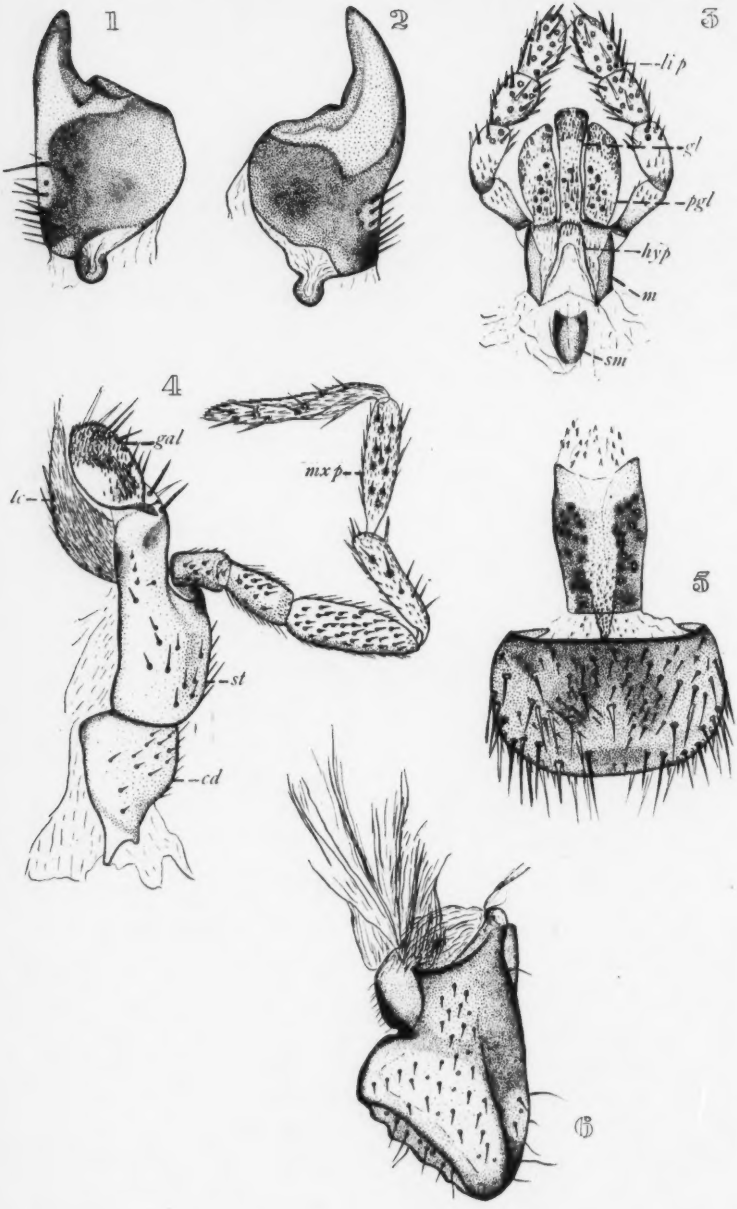
Mr. Kirkaldy exhibited a volume of a German translation of DeGeer's "Memoirs," published from 1770-1780. Mr. Kirkaldy related that DeGeer destroyed almost all the copies of the first volume of the original edition soon after it appeared; he also stated that it contains a good many notes on the habits of the insects treated of.

Dr. Evans related some interesting experiences with the fire flies (*Pyrophora*) in Porto Rico. He also spoke of the very injurious mole-cricket (*Scapteriscus didactylus* Latr.). The Porto Ricans are convinced that this mole cricket, or Changa as they call it, was brought there in a cargo of guano twenty-seven years ago. It is a strong flyer, burrows in the ground, is very destructive to all kinds of vegetation, and seems to prefer dry, loose, sandy soil.



Van Dine Del.

MOUTH PARTS OF TENTHREDINIDAE.



Van Dine del.

MOUTH PARTS OF TENTHREDINIDAE.

JUNE 20th, 1905.

The sixth regular meeting of the Society was held in the usual place, Mr. Perkins in the chair.

Resolutions upon the death of Dr. Packard were presented: *"Whereas,* the Hawaiian Entomological Society has learned with deep regret of the irreparable loss to science of Dr. Alpheus Spring Packard, be it

'Resolved, That a vote of condolence be extended to the family of Dr. Packard; and that the same be recorded on the minutes of the Society.

D. L. VAN DINE,
G. W. KIRKALDY,
Committee."

PAPERS.

Mr. R. C. L. PERKINS read *"Notes on a Collection of Butterflies Made During a Recent Trip to Australia."* The following is an abstract of his remarks:

He had always watched such butterflies as were around the cane-fields, and having made himself fairly well acquainted with the Australian species in Museums he had not the least difficulty in identifying most of the species on the spot, and confirmed these identifications subsequently.

Being in the Cairns district only in July and August, probably two of the worst months for butterflies, he saw only a fraction of the species that are found there. In all he observed in Australia between 80 and 90 species, the greater part at Cairns in the months mentioned. He observed that the well-known difficulty of killing the various species of Danainae extended to all those he observed, but he had noticed one specimen of *Anosia erippus* killed by some predaceous creature. Although birds were in numbers, and insects at their scarcest, he saw no bird attack any butterfly, though he was always on the watch for this. There semblance between *Hamadryas zoilus* of the above subfamily, and the Nymphaline *Neptis staudingereana* is quite remarkable, and the two fly together. Both were scarce no doubt simply because they were out of season. The pretty *Cethosia cydippe,* with *Cupha prosope* and *Atella egista* are all found in the scrub, on the edges of cane-fields. *Mynes geoffroyi* is very like females of the Pierid,

Delias nigrina superficially, so much so that when Koebele first went to Cairns years ago, the late Mr. Olliff asked him to look out for this Pierid. It is of course really Nymphaline, and the gregarious larvae and pupae in clusters, the former being very like the common English *Vanessa urticae* or *io*, are found on stinging-nettle trees. It is common, but the larvae are much destroyed by predaceous bugs.

Charaxes sempronius abounded from Cairns to Brisbane, wherever he stopped. It feeds on many trees, preferring Leguminosae. The larvae are parasitized by Ichneumons, and the eggs mostly destroyed by a *Teleas*.

Melanitis leda is a Satyrine, very leaf-like in repose. It varies enormously on the underside, and is generally like a dead leaf in colour, and its variations represent leaves in all stages of fungous attack. It settles abruptly on the ground, like some other leaf-butterflies. A conspicuous ocellated form, however, occurs, and is very little leaf-like. Lycaenidae are very numerous. The beautiful *Lampides caelestis* is common near Cairns; *Cyaniris tenella* was also noticed there; and a form of *Danis taygetus*, quite constantly distinct from the Richmond River form of this common butterfly, abounded; *Philiris kamerungae* abounds near Cairns and was seen swarming over the bushes, although it is a comparatively recently described species; the beautiful but very common *Arhopala amytis* was often noticed settling on the nests of the abominable green tree-ant (*Oecophylla*). The very common, but pretty, yellow butterflies of the genus *Terias* are interesting from their variability. The pink-suffused form of *T. herla* was noted at Cairns and Bundaberg.

Two *Elodina* very common at Bundaberg are interesting from their seasonal variation, but *Hubhina perimale* is still more interesting in this respect. A vast migration of *Belenois java* was witnessed on the Bundaberg coast. *Delias nigidius*, a local butterfly, abounds at Cairns. Several of the species of *Delias* can be bred in quantities from larvae on parasitic mistletoes.

The handsome blue *Papilio ulysses* is very common in Cairns district, and eggs, larvae and pupae were easily found.

Of the Hesperidae, about 16 species only were noticed, the least commonplace in appearance of these being the black and white *Erynnis caesina* and *Notocrypta feisthamelii*, which flew together

in the shade near Cairns with swarms of the beautiful *Lampides caelestis,* already mentioned.

Exhibitions and Notes.

Mr. Weinrich exhibited pupae and imagines of *Volucella obesa,* which he had observed breeding in the sisal juice. In the course of one-half to an hour's time perhaps 5,000 eggs were laid. Mr. Kotinsky referred to two species of Coccidae; one a Dactylopiine, the other an *Aspidiotus* which he had observed on manienie grass on Maui and Hawaii.

JULY 10th, 1905.

The seventh regular meeting of the Society was held in the usual place, Mr. Perkins in the chair.

Election of member—Mrs. Wm. Weinrich.

Exhibitions and Notes.

Mr. Wilder exhibited some lichee nuts and a moth which had issued from one of these. Mr. Perkins stated that while he could not name the insect, he was sure that it is the same species that commonly infested leguminous pods on these islands. Mr. Kotinsky said he has bred this insect from the pod of *Acacia farnesiana,* commonly called Mimosa or "glue." Mr. Wilder also showed a collection of insects made in his yard. Mr. Terry exhibited a collection of the more common insects, both sexes of each species being represented, in order to show the characteristic differences between the sexes.

Mr. Perkins exhibited a collection of native bees and wasps to demonstrate what, in his opinion, is the ideal way of mounting those insects. The wings and legs were spread uniformly, the insects being pinned with short silver pins on strips of white-papered cork or specially prepared white fungus, raised high on a long and stout pin. The insects need never be directly handled, and could be examined perfectly both above and beneath with a strong lens. Brother Matthias stated that he has also been in the habit for some time of using fungus found on kukui trees in place of cork.

Mr. Perkins exhibited a Phasmid from Mexico; this insect looked so much like a bit of brown, crumpled up leaf that even in the exhibition box great difficulty was experienced in recognizing that the object was an insect. He also exhibited two specimens,

one green, the other brownish, of a Phasmid from Fiji, the dorsal appearance of which resembled a leaf so perfectly that none but a trained eye could locate it in situ.

Mr. Swezey exhibited a series of the stages of *Zelus peregrinus* Kirkaldy from the egg to the imago and detailed the life-history and habits of this predaceous insect.*

AUGUST 3rd, 1905.

The eighth regular meeting was held on this date, Mr. Perkins in the chair.

Papers.

Mr. R. C. L. Perkins presented a paper on *"Food Habits of Native Hawaiian Birds."* The following is a brief summary:

The Hawaiian Birds are classed according to their food-habits as follows:

(1) Honey or nectar suckers; useful because pollinizers.
(2) Beneficial fruit-eaters which spread the seeds without injuring them, and propagate the native plants.
(3) Harmful fruit-eating birds, which destroy seeds they eat.
(4) Eaters of injurious insects; beneficial.
(5) Eaters of useful insects are practically unrepresented.

In the family *Drepanididae* there are 34 species on the Hawaiian Islands; 1½ of these feed on nectar regularly; 2 are doubtful honey-eaters; 7 rarely eat honey, yet were seen eating it; they have honey-sucking tongues and are apparently leaving off the honey-sucking habit and are taking to insect-eating; 30 species eat noxious insects, certainly all of them feed their young on insects; most of these eat spiders which may be either beneficial or otherwise; 3 are beneficial fruit-eaters 3 are highly injurious fruit- or seed-eaters, yet these also eat caterpillars and feed them to their young, and are thus far beneficial; 2 species are indifferent.

Of the four Oo, 2 are chiefly honey-suckers, but also eat insects and one is chiefly an insect-eater; one is extinct. Most of these birds are now too rare to be of practical value.

Of the five thrushes, which are very fine songsters, four are largely fruit-eaters, but also devour insects; the fifth is an insect-

* Since published in Bull. H. S. P. A. Ent. I, pp. 232-4. Pl. XVI figs. 1-3.

eater confined to Kauai. There are three species of fly-catchers, all entirely insectivorous and very beneficial.

Exhibitions and Notes.

Mr. Swezey exhibited specimens of *Dacus cucurbitae* which he had bred from string beans; he also showed a red Tortrix, name unknown, but identical with the one bred by Mr. Wilder from lichee nuts and exhibited at the previous meeting. This moth Mr. Swezey has also bred from the pulp of mango. Mr. Swezey also presented interesting notes on the habits of *Callineda testudinaria,* since published in the Bull. H. S. P. A. Ent. I, pp. 224-8, Pl. XV., figs. 1-4.

Referring to *Dacus cucurbitae,* Mr. Craw stated that he had also observed this insect at work upon beans, and Mr. Perkins stated that Mr. Van Dine in his 1904 annual report refers to this same insect observed on the same plant. Mr. Kotinsky wondered at the possibility of raising melons or cucumbers anywhere on these islands in view of the unchecked presence of this fruit fly. To inquiries for remedies against this pest he always replied suggesting clean culture, destruction of infected parts and liberal feeding of the plants liable to injury by this insect. Mr. Weinrich stated that he had experimented with a tenth of an acre plot of melons. He covered some of the fruit as soon as it set, but afterward found that while some of the covered melons were stung, many of those uncovered were unstung. He suggested the possibility of raising melons on the windward side of this island by the prevalence of strong winds which drive the fly away. His experiment with raising musk melons was a total failure; one of these fruits showed absolutely no traces of the fly sting but was, however, full of the maggots when cut open. These maggots were small, and Mr. Swezey offered the suggestion that the puncture might have been a very recent one, which would account for the difficulty of discovering it. Mr. Austin stated that he saw musk melons that were raised near Diamond Head. The fly, he said, attacks the vine as well as the fruit of melons and cucumbers. Mr. Perkins also referred to an observation he made on wild figs in Australia, which he found so full of fruit fly maggots that they could not reach maturity. Mr. Terry stated that he observed at Kaimuki a kind of cucumber grown by the Chinese. To protect these from the ravages of the fly these people usually

wrapped the fruit in paper, twisting it only at the stem end of the fruit, the other end being left entirely exposed and yet the method seemed quite efficacious. Mr. Krauss of Kamehameha School (present as a visitor), stated that to his observation, *D. cucurbitae* is less injurious on windy days. The fly being erratic and food quite abundant, even an incomplete covering will suffice to check its ravages. He has also found useful hints in the use of resistant varieties of the fruits liable to attack. Mr. Clark of Wahiawa, and the Kamehameha School, are growing what are known as cherry-and plum-tomatoes which are free from attack by this pest. This is likewise true of a hard-skinned variety of squash which he is growing. He has also observed that the more extensive a field of a certain crop is, the less subject it is to attack. Mr. Craw stated that certain varieties of cherries in California are known to be immune to the San Jose Scale. Mr. Swezey said that in the course of his inspection work in Ohio he had found that sour cherries and Kiefer pears were always free from San Jose Scale. Mr. Austin has observed that rose bushes which he is growing within a slat house are absolutely free from injury by the Japanese beetle, whereas a single twig of this same rose that projected outwardly through the slats had its leaves injured by the beetle.

Mr. Perkins exhibited specimens and illustrations of certain leaf-hopper parasites (*Stylopidae*), which are described and figured in a bulletin soon to be issued, and made some further remarks.*

He said that though he had given an interpretation of the mouth parts, different from that of Eaton, he was prepared to find that the latter might be right, or both wrong. Thus it was quite possible that the true mouth was what he called the "foramen" in his figures. This occupied a half-way position, between those assigned to the mouth opening by Eaton and himself. The study of the puparia and of the parts of the immature insect within, as well as of the parts of the female head in the Xenini would very likely conclusively settle the point, but he had not yet had time to make the necessary study of these. It was quite clear that the head-parts in the adult males and females, and the less distinct ones in the puparium, could be homologized.

Mr. Perkins further stated that years ago he had observed that

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* See Bull. H. S. A. Ent. I, pp. 86-111, Pls. 1-4.

some carpenter bees from India had in the basal abdominal segment a chamber, which was always full of Acari; the females alone possess this acarid cavity. The relation of these acarids to their hosts is uncertain, Mr. Perkins believing that they are injurious. A Mexican wasp (*Odynerus*), which he had also examined, had a special Acarid chamber formed by a modification of the second abdominal segment, where it is overlapped by the first; he exhibited also an Australian wasp in which this cavity was located in the posterior face of the propodeum.

SEPTEMBER 14th, 1905.

The ninth regular meeting of the Society was held at the usual place, Mr. Van Dine in the chair.

Exhibitions and Notes.

Mr. Kotinsky remarked that the work of compilers of lists, etc., of groups of insects is undoubtedly commendable, and to the workers in those groups very useful, but like everyone else they are likely to commit errors. Among the most regrettable of these is the tendency to alter names without apparently satisfactory reason or authority. To illustrate, he cited the following instance: In the Transactions of the New Zealand Institute Vol. XXVII p. 46, Maskell reports *Mytilaspis pallida* var. (?) "on *Podocarpus,* Hawaiian Islands from Japan." In the American Naturalist Vol. XXXI p. 704 (1897), Cockerell, referring to this variety, names it *maskelli.* In compiling his list of Coccidae for the Fauna Hawaiiensis in 1902, Kirkaldy disregards Maskell's "variety (?)", apparently overlooks Cockerell's note upon this variety, and reports *"Lepidosaphes pallida* on *Podocarpus,* Hawaiian Islands from Japan." As a result, Mrs. Fernald in her "Catalogue of the Coccidae" credits *"Podocarpus,* Hawaiian Islands from Japan" with both *L. pallida* and its variety *maskelli.* the one on the authority of Kirkaldy, the other of Maskell. While *L. pallida* probably exists upon these islands, Kirkaldy apparently had no authority for his record.

Mr. Kotinsky also stated that through the courtesy of Dr. Russel, who is now in Japan, a colony of *Chilocorus similis* Rossi was received from that country, three adults and five pupae arriving in good condition. The imagines issued from these pupae shortly after arrival and subsequently the colony was reduced to

five vigorous beetles. As *Diaspis pentagona* and *Aspidiotus perniciosus* are the principal hosts of this Coccinellid, and as the breeding place of neither of these species was then known, their food problem was solved by the selection of *Aulacaspis rosae,* as this was accepted readily, and the females of the colony soon commenced to lay eggs. At the present time fifteen beetles have been brought to maturity and a large number of eggs, larvae and pupae are in a thriving condition. Several days ago Mr. Austin discovered at Mokuleiia a number of peach trees badly infested with San Jose scale. Twigs of these were secured, and supplied the beetles with food which they seemed to welcome. In course of his work with the rose scale as food for *C. similis,* Mr. Kotinsky observed *Rhizobius towoombae* Blackburn, breeding freely on the rose scale. On a bit of twig not four inches long and about one-fourth of an inch in diameter freshly brought in from a field, he counted eleven larvae of this Coccinellid and many more have issued since. This same Coccinellid he also observed in abundant numbers upon *Chionaspis rhododendri* Green, on *Poinciana pulcherrima* and *Waltheria americana.* He also stated that he had bred the Chalcid *Aphelinus fuscipennis,* from almost every Diaspine that came under his observation. In the near future he hoped to publish a full list of its hosts on these islands.

OCTOBER 15th, 1905.

The tenth regular meeting of the Society was held at the usual place, Mr. Perkins in the chair.

The Secretary read a congratulatory note to the Society from the Honorary Secretary, Mr. R. J. Wiggelsworth, of the Manchester Entomological Society.

Exhibitions and Notes.

Mr. Kirkaldy took exception to Mr. Kotinsky's note, re *Lepidosaphes pallida,* at the last meeting and expressed his opinion that the status of the species was as follows:

1. *L. pallida* (Maskell 1805)
   =*maskelli* (Cockerell 1897)

Found in the Hawaiian Islands.

2. New name wanted, if really distinct—
   = || *pallida* Green 1896 (not Maskell 1895)

Not found in the Hawaiian Islands.

Although usually ascribed to Green, the author of *pallida* must be held to be Maskell, since he was the first to describe it. The confusion arose, as in so many other cases, from the distribution of new forms under manuscript names, long before publication.

Mr. Kirkaldy also exhibited specimens of the following water bugs.

Laccotrephes sp. from Lake Tanganyika, Africa, showing enormously long breathing tube.

Belostomatid from Assam.

Amorgius indica from India, and

Ranatra chinensis from Yokohama.

Mr. Craw announced that *Scutellista cyanea* had been introduced and successfully bred on *Saissetia nigrum* upon *Hibiscus* in a cage. Several of these plants were transferred to Kapiolani Park, where this scale abounds, for further propagation. He was pleased to observe evidences of work by this parasite upon the identical scale in the park from specimens released there some five weeks ago. It was interesting to note that this insect had completed a life cycle upon these islands in about 30 days, whereas it required from 40 to 47 days to do so in California.

Mr. Kotinsky stated that he had bred *Spalangia hirta* Haliday, from pupae of *Haematobia serrata* collected on Oahu and Molokai on elevations ranging between a hundred and eighteen hundred feet. Of the Molokai pupae about 60 to 75 per cent. were found parasitized. To his knowledge Mr. Terry had bred the same parasite as well as *S. lanaiensis* Ashm. from dipterous pupae collected in horse droppings at the Volcano House, Hawaii. Identifications of the parasite were kindly made by Mr. Perkins and by Dr. Ashmead of Washington.

NOVEMBER 2nd, 1905.

The eleventh regular meeting of the Society was held on this date, Mr. Perkins in the chair.

The chairman appointed Messrs. Giffard and Kotinsky to consider the advisability of having public lectures on Entomology delivered at least once a year.

Exhibitions and Notes.

Mr. Kotinsky stated that a bit of twig and leaves received a few days ago from Mr. E. H. Edwards of Kona, and labelled "Giant lemon from Fiji," was found plastered by (*Lecanium*) *Coccus viridis* (Green). Of the entire lot, only one specimen was observed showing evidence of having been parasitized. Since Mr. Green, the author of the species, reports the insect as one of the most destructive enemies of coffee plants in Ceylon, he was inclined to regard the discovery of its establishment in Hawaii with some alarm. It is true Mr. Green reports that about 90 per cent. of the insect is destroyed by a fungus disease during the rainy season. There is nothing to indicate that that useful fungus was introduced with the pest into Hawaii. Mr. Green also records some four species of Hymenopterous parasites bred from *C. viridis* in Ceylon, but so little is known about the scale in Hawaii that he was not even aware whether any of those parasites were brought along, nor could he tell whether the scale insect parasites already here will take readily to the new-comer. In view of these facts, he had been commissioned by Mr. Craw to proceed to Kona at the first opportunity and make the necessary investigations.

Mr. Perkins expressed the doubt that any *Lecanium* could become a serious pest on these Islands in view of the large varicty of their enemies introduced and established here by Mr. Koebele.

Mr. Kotinsky also reported the finding of (*Lecanium*) *Coccus mangiferde* (Green) in injurious numbers upon the Alfons (Indian) variety of mango in the Moanalua Gardens. Mr. Craw believed that he had observed the same scale upon trees in Mr. Giffard's yard; Mr. Giffard thought that such would not be impossible, since he has frequently exchanged plants with the Gardens.

Mr. Giffard exhibited a female of what is probably a species of *Microcentrum* collected in his house on October 24, 1905. This is the first specimen of the species to have been collected in the Hawaiian Islands, which would indicate that it is a recent introduction.

Mr. Craw stated that he is keeping some 250 boxes or oranges from Japan in quarantine, the oranges being infested with some six species of scale insects. Mr. Perkins advised the breeding of parasites from these scales and releasing them, as he had already

done this with scale imported on plants from Fiji and elsewhere.

Mr. Perkins exhibted a collection of insects recently made by Mr. G. P. Wilder on Midway and Laysan Islands. Following is a list of the exhibit:

LEPIDOPTERA

Agrotis saucia. Laysan.
Agrotis sp? Laysan.
Prodenia sp? Midway.
Plusia verticillata. Midway.
Hymenia recurvalis. Laysan.
Pterophorid sp? Laysan.

DIPTERA

A small Acalypterate Muscid. Laysan.
A small Tachinid. Midway.

HYMENOPTERA

Eupelmus sp? (Chalcididae.) Laysan.
Tetramorium guineense (Myrmicidae). Laysan.

NEUROPTERA

Chrysopa sp? Midway.

COLEOPTERA

Thallattodora insignis. Midway.
Pentarthrum sp? Midway.

Mr. Perkins remarked that Mr. Wilder had very little time to collect insects on Midway and practically no time on Laysan. With regard to the species now exhibited, *Agrotis saucia* is a very widely destributed and injurious species and is common in the Islands. The second *Agrotis* is one of the most obscure species of that enormous and most difficult genus, and evidently allied to our Island forms. The *Prodenia* is hardly separable from a Mexican species, also exhibited. *Hymenia recurvalis* is one of the commonest Hawaiian moths, and also very numerous in Queensland and the Malay Islands. The small Pterophorid is also of the commonest Honolulu species. The Acalypterate Muscid is an abundant Honolulu species; the Tachinid probably identical with one of ours, and parasitic on *Plusia.* The *Eupelmus* is a male unique, and very likely the same as one of our several species. The ant is a cosmopolitan species. The *Chrysopa* is not like any

species now found on the Islands, but it might be the *C. oceanica* of Walker, gathered by the Beechey expedition three quarters of a century ago. If not, it is no doubt new, and in any case interesting. The Coleoptera are represented by the two Cossonidae from Midway, the first being identical with the unique specimen from Lanai described by me in the Fauna Hawaiiensis; the second is a commonplace *Pentarthrum,* possibly the common *P. obscurum* of these Islands. I advised Mr. Wilder not to collect the Dermestids found in dead birds, the Sarcophagid flies, etc., as I had previously seen such from Laysan and they were of little interest, though most abundant there. But for this he would no doubt have obtained more specimens and species in spite of the limited time.

Mr. Perkins further exhibited six female specimens of *Reduviolus,* two from Oahu, two from Molokai, and two from Hawaii. He said that according to Mr. Kirkaldy's views in the Fauna Hawaiiensis these would all be placed under *R. lusciosus,* but that in his opinion these six individuals represented four distinct species, since they exhibit marked differences in the structure of the terminal segments. It was observed that while the two Oahu examples agreed together exactly, as also did the two from Molokai, the two from Hawaii were not alike, and were also unlike those from Molokai or Oahu, and that these sexual differences were accompanied by other quite evident but more superficial distinctions in each case.

Mr. Perkins also exhibited two specimens and drawings of a Chalcid parasite, and its host, an Australian Jassid leaf-hopper, being one of the two species of Chalcids known to be parasitic on nymph or adult hoppers. The form exhibited represents a new genus and species, which he proposed to describe as *Neocladia howardi.*

DECEMBER 7th, 1905.

No regular meeting was held on this date, owing to the lack of a quorum.

APPENDIX.

LITERATURE OF 1905 DEALING WITH THE HAWAIIAN ARTHROPODA.

COMPILED BY G. W. KIRKALDY.

1. CRAW, A.: "Fighting Insect-Pests with Insects"; Haw. Forester II 321-5 (Nov.)

2. HAMPSON, G. F.: "Catalogue of the Noctuidae in the Collection of the British Museum," V 1-634, Plates LXXVIII-XCV. The Hawaiian Noctuidae of the subfamily Hadeninae are redescribed, in some cases the nomenclature being altered.

3. HIGGINS, J. E.: "Citrus Fruits in Hawaii"; Bull. Hawaii (U. S.) Exp. Sta. 9 pp. 1-31 Pls. I-III, figs 1-7.

p. 25-6 *Mytilaspis citricola* [recte *Lepidosaphes beckii*], fig. 7; p. 26 other Coccidae; p. 26-7 Orange-aphis; p. 27 *Phytoptus oleivorus.*

4. KELLOGG, V. L.: "American Insects."

P. 308. Danger of yellow fever due to presence in Hawaii of *Stegomyia fasciata*; on p 451 it is mentioned that *Anosia plexippus* (figured) is the commonest butterfly throughout the Hawaiian Islands.

5. KOTINSKY, J.: "Entomological Notes", &c.; Haw. For. II, 266-9 (Sept.), 295-9 (Oct.), 361-4 (Nov.)*, 397-404 (Dec.).

6. PERKINS, R. C. L.: "Leaf-hoppers and Their Natural Enemies"; Bull. H. S. P. A. Ent. 1, Part 1, Dryinidae, pp. 1-69 (May 27), Part 3, Stylopidae, pp. 86-111, Pls. 1-4 (Aug. 8), Part 4, Pipunculidae, pp. 119-57, Pls. 5-7 (Sept. 9), Part 6, Mymaridae, &c., pp. 183-205, Pls. 11-13 (Nov. 13).

7. SCHOUTEDEN, H.: "Monographie du genre Coleotichus"; Ann. Mus. Hung. III 317-60, Pls. 8-9.

pp. 319, 320, 325-8, Pl. 8, f. 20, *C. blackburni* (sic!).

8. SMITH, J. G.: "Annual Report of the Hawaiian Agricultural Experiment Station, 1904"; Rep. U. S. Office Exp. Sta. 1904, pp. 372-9. (Entomological work. D. L. Van Dine.)

Lists of insects injurious to Sugarcane, Coffee, Citrus, Avocado Pear, Tobacco &c.

9. SWEZEY, O. H.: "Leafhoppers and Their Natural Ene-

*Reprinted as "Circ. Ent. Board Agr. Hawaii" 2, pp. 1-4, 4 figs.

mies. Part VII, Orthoptera, Coleoptera, Hemiptera." Bull. Ent. H. S. P. A., 1, pp. 207-38, Pl. 14-17 (Dec. 30).

10. TERRY, F. W.: "Leafhoppers and Their Natural Enemies. Part V. Forficulidae, Syrphidae and Hemerobiidae," l. c., 159-81, Pls. 8-10 (Nov. 13).

11. VAN DINE, D. L.: "A Partial Account of Insects Affecting Tobacco in Hawaii"; Hawaiian For. II, 31-6, figs. 1-2 (Feb.), 76-9, f. 3 (Mar.), 98-9, f. 4 (Apl.), 162-6, f. 5 (June).

12. VAN DINE, D. L.: "Insect Enemies of Tobacco in Hawaii"; Bull. Hawaii (U. S.) Agr. Sta. 10, pp. 1-16, fs. 1-6, (dated May 31).

13. VAN DINE, D. L.: "The Mango Weevil in Hawaii. *Cryptorhynchus mangiferae* Fabr." Haw. For., II, 231-3 (Aug.).

14. VAN DINE, D. L.: "The Introduction of the Mango Weevil," l. c., 313-5 (Oct.).

15. VAN DINE, D. L.: "Fuller's Rose Beetle (*Aramigus fulleri* Horn). Press Bull. Haw. (U. S.) Agr. Sta., 14, pp. 1-8, 1 fig. (Oct. 19).

16. See also SMITH J. G.

Notices of the HAWAIIAN ENTOMOLOGICAL SOCIETY have appeared in

Haw. Forester, II, 50-3 (Feb.), 87-8 (March).

Entomologist, XXXVIII, 120 (April).

Entomological News, XVI, 121-3 (April).

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